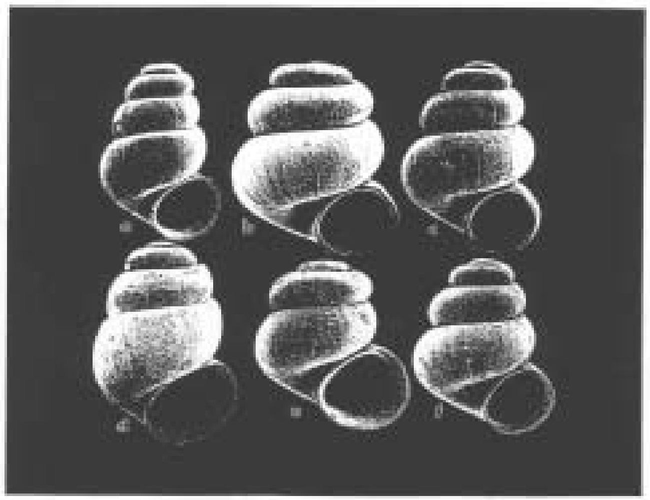
Conservation Assessment for Organ Cavesnail (Fontigens tartarea)



(From Hershler, et al., 1990)

USDA Forest Service, Eastern Region

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This Conservation Assessment was prepared to compile the published and unpublished information on Fontigens tartarea. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject community and associated taxa, please contact the Eastern Region of the Forest Service Threatened and Endangered Species Program at 310 Wisconsin Avenue, Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

The Organ Cavesnail is designated as a Regional Forester Sensitive Species on the Monongahela National Forest in the Eastern Region of the Forest Service. The purpose of this document is to provide the background information necessary to prepare a Conservation Strategy, which will include management actions to conserve the species.

The Organ Cavesnail is a rare cavernicolous mollusk that is known only from the karst of eastern West Virginia. In that area it has been reported from 11 caves in five counties.

NOMENCLATURE AND TAXONOMY

Classification: Class Gastropoda
Order Prosobranchia
Family Hydrobiidae

Scientific name: Fontigens tartarea

Common name: Organ Cavesnail

Synonyms: Fontigens holsingeri

Fontigens tartarea was described by Hubricht (1963) from Organ Cave, Greenbrier County, West Virginia. Hubricht subsequently described Fontigens holsingeri (1976) from Harman Cave, in Randolph County, West Virginia. Fontigens holsingeri was found to be a morphological variant of Fontigens tartarea by Hershler, et al. (1990) and synonymized accordingly. A detailed redescription of Fontigens tartarea accompanied by illustrations and SEM micrographs was also presented by Hershler, et al. (1990).

DESCRIPTION OF SPECIES

Fontigens tartarea is a small aquatic snail species. It has an ovate to elongate conical shell that is between 1.0-2.3mm in height. The animal is unpigmented (Hershler, et al., 1990). Identification requires a specialist familiar with the systematics of hydrobiid snails.

LIFE HISTORY

Hershler, et al. (1990) noted the paucity of study concerning the tiny North American hydrobiid snails, including Fontigens. Feeding preference is inferred by the fact that the epigean hydrobiids in general are most commonly found on aquatic vegetation, while cavesnails usually occur on the undersides of stones in cave stream riffles. Presumably the snails are removing and feeding upon the plant or microbial material present when using these substrates.

HABITAT

Fontigens tartarea is an obligate cavernicole. Holsinger, et al. (1976) reported that it was typically found under flat rocks in streams with moderate current. Its distribution with a cave stream was sporadic. Most rocks examined had no snails, while others had up to 10 snails.

DISTRIBUTION AND ABUNDANCE

Fontigens tartarea was reported by Holsinger, et al. (1976) from 7 caves in the karst of eastern West Virginia. Hershler, et al. (1990) expanded this list to 11 caves distributed through the Greenbrier, Monroe, Pocahontas, Randolph and Tucker counties in eastern West Virginia.

Figure 1. *Distribution of Fontigens tartarea (from Hershler, et al., 1990).*

RANGEWIDE STATUS

Global Rank: G2 imperiled; The global rank of G2 is assigned to species that are known from between 6-20 localities.

West Virginia State Rank: S2 imperiled; Similarly, the state rank of S2 is assigned to species that are known from between 6-20 localities in the states. All known collections of this species have come from West Virginia.

POPULATION BIOLOGY AND VIABILITY

Nothing is known of the population biology of Fontigens tartarea.

POTENTIAL THREATS

Due to the presence of Fontigens tartarea in the restricted cave environment, it is susceptible to a wide variety of disturbances (Elliott, 1998). Caves are underground drainage conduits for surface runoff, bringing in significant quantities of nutrients for cave communities. Unfortunately, contaminants may be introduced with equal ease, with devastating effects on cave animals. Potential contaminants include (1) sewage or fecal contamination, including sewage plant effluent, septic field waste, campground outhouses, feedlots, grazing pastures or any other source of human or animal waste (Harvey and Skeleton, 1968; Quinlan and Rowe, 1977, 1978; Lewis, 1993; Panno, et al 1996, 1997, 1998); (2) pesticides or herbicides used for crops, livestock, trails, roads or other applications; fertilizers used for crops or lawns (Keith and Poulson, 1981; Panno, et al. 1998); (3) hazardous material introductions via accidental spills or deliberate dumping, including road salting (Quinlan and Rowe, 1977, 1978; Lewis, 1993, 1996).

Habitat alteration due to sedimentation is a pervasive threat potentially caused by logging, road or other construction, trail building, farming, or any other kind of development that disturbs groundcover. Sedimentation potentially changes cave habitat, blocks recharge sites, or alters flow volume and velocity. Keith (1988) reported that pesticides and other harmful compounds like PCB’s can adhere to clay and silt particles and be transported via sedimentation.

Impoundments may detrimentally affect cave species. Flooding makes terrestrial habitats unusable and creates changes in stream flow that in turn causes siltation and drastic modification of gravel riffle and pool habitats. Stream back-flooding is also another potential source of introduction of contaminants to cave ecosystems (Duchon and Lisowski, 1980; Keith, 1988).

Smoke is another potential source of airborne particulate contamination and hazardous material introduction to the cave environment. Many caves have active air currents that serve to inhale surface air from one entrance and exhale it from another. Potential smoke sources include campfires built in cave entrances, prescribed burns or trash disposal.

Concerning the latter, not only may hazardous chemicals be carried into the cave environment, but the residue serves as another source of groundwater contamination.

Numerous caves have been affected by quarry activities prior to acquisition. Roadcut construction for highways passing through national forest land is a similar blasting activity and has the potential to destroy or seriously modify cave ecosystems. Indirect effects of blasting include potential destabilization of passages, collapse and destruction of stream passages, changes in water table levels and sediment transport (Keith, 1988).

Oil, gas or water exploration and development may encounter cave passages and introduce drilling mud and fluids into cave passages and streams. Brine produced by wells is extremely toxic, containing high concentrations of dissolved heavy metals, halides or hydrogen sulfide. These substances can enter cave ecosystems through breach of drilling pits, corrosion of inactive well casings, or during injection to increase production of adjacent wells (Quinlan and Rowe, 1978).

Cave ecosystems are unfortunately not immune to the introduction of exotic species. Out-competition of native cavernicoles by exotic facultative cavernicoles is becoming more common, with species such as the exotic milliped Oxidus gracilis affecting both terrestrial and aquatic habitats.

With the presence of humans in caves comes an increased risk of vandalism or littering of the habitat, disruption of habitat and trampling of fauna, introduction of microbial flora non-native to the cave or introduction of hazardous materials (e.g., spent carbide, batteries). The construction of roads or trails near cave entrances encourages entry.

SUMMARY FO LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

Much of the range of Fontigens tartarea is within the boundaries of the Monongahela National Forest.

SUMMARY OF MANAGEMENT AND CONSERVATION ACTIVITIES

No species specific management or conservation activities are being conducted concerning Fontigens tartarea.

The existing (1985) Monongahela Land and Resource Management Plan does not provide management direction for caves although they are being considered in the Forest Plan revision currently underway. A Forest Plan Amendment in progress for Threatened and Endangered Species will include management for the caves on the forest.

RESEARCH AND MONITORING

No species specific research or monitoring activities are being conducted concerning Fontigens tartarea.

RECOMMENDATIONS

Retain on list of Regional Forester Sensitive Species.

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